

RESEARCH NOTES

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TWENTY-YEAR GROWTH OF UTAH JUNIPER IN ARIZONA

by

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Ten-year growth of Utah juniper (*Juniperus osteosperma* (Torr.) Little) on 4 acres near Sedona, Arizona, was reported in 1953.² Additional records have now provided 20 years' growth information for this widespread but little-studied woodland type.

The stand, composed almost entirely of Utah juniper, had been lightly cut for fenceposts in 1938 before the study started. When first measured in 1938, the stand had 81 stems (single-boled trees or stems branching below a stump height of 1 foot above the ground) per acre 3.6 inches or larger in stump diameter. These contained 481 cubic feet of stem wood with 59 fenceposts.

Field and computation procedures paralleled those reported by Herman.² Volumes were obtained from stand tables and a volume table, both based on stump diameter. Growth habit of the trees prevented obtaining meaningful diameters at breast height. Minimum dimensions for fenceposts were: length, 7 feet; butt diameter, 6 inches; and top diameter, 3 inches. Measurements were obtained on 3 acres rather than on the original 4; the 1938 data presented here therefore differ slightly from those reported by Herman in 1953.

Growth continued to be slow throughout the 20-year period, though better in the second decade than in the first. Stump diameters increased 0.66 to 1.95 inches (table 1). Height growth was negative in many trees larger than 18 inches diameter because of dying back of the tops. Except for this, there was no relation between stump diameter and growth in height, diameter, or volume.

¹ Research reported here was conducted at Flagstaff, Arizona, in cooperation with Arizona State College.

² Herman, F. R. A growth record of Utah juniper in Arizona. Jour. Forestry 51: 200-201, illus. 1953.

Gross annual increment and ingrowth were greater for the 20-year period than for the first decade. But as mortality was also greater, net annual increment was the same. Gross annual increment averaged 3.5 cubic feet, ingrowth 0.5 cubic foot, and mortality 1.1 cubic feet per acre, leaving a net annual increment of 2.9 cubic feet. The volume of most trees increased less than 1 cubic foot for the full 20 years.

Production of fenceposts continued at the rate of one post per acre per year.

Reduced height and increased mortality emphasize the continued decline of the larger trees. Their replacement by juniper seedlings is already in progress.

Table 1. --Average 20-year growth of Utah juniper by stump diameter classes

Stump diameter ¹ (inches)	Trees	Height	Stump diameter	Total height	Volume
	Number	Feet	Inches	Feet	Cubic feet
4- 6	76	12.1	1.20	1.01	0.81
7-10	56	15.3	.99	.36	1.06
11-14	40	18.3	.95	1.04	1.21
15-18	23	21.4	.66	.68	.71
19-22	15	22.3	1.02	-1.07	.94
23-26	7	23.6	.89	-.73	.87
31-32	2	28.5	1.95	-1.55	2.54

¹ Diameter 1 foot above ground.